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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHOW, LIXI	

ART UNIT	PAPER NUMBER
2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/806,320	AHN ET AL.	
	Examiner	Art Unit	
	Lixi Chow	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2007*.

2a)☐ This action is **FINAL**., 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12 and 16-24* is/are rejected.

7)☒ Claim(s) *11, 14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10, 12, 16, 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US 5,150,351; hereafter Ohno) in view of Ichihara (US 6,396,792).

Regarding claim 1:

Ohno discloses an apparatus (see Fig. 6) for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level less than the first level (see Figs. 4(a) and 4(b)), respectively, in an optical recording apparatus, the apparatus comprising:

a recording waveform generating unit (Fig. 6, element 8) generating a recording waveform which includes:

a first multi-pulse corresponding to the first level of the input data and alternating between a low first multi-pulse level and a high first multi-pulse level (see Fig. 4(b); first multi-pulse corresponds to multi-pulse when the input signal is high),

a second multi-pulse preceding the first multi-pulse and corresponding to the second level of the input data, the second multi-pulse alternating between a low second multi-pulse level and

a high second multi-pulse level (see Fig. 4(b); second multi-pulse corresponds to multi-pulse when the input signal is low),

a leading one of the pulses of the second multi-pulse set to the low second multi- pulse level (the leading pulse of the second multi-pulse is at power level Pr, which is a low second multi-pulse pulse level).

Ohno fails to disclose the power level between an end of the second multi-pulse and a first one of the pulses of the first multi-pulse set to the high second multi-pulse level. However, Ichihara discloses an apparatus for forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data, comprising:

A waveform generating unit generating a first multi-pulse and a second multi-pulse, wherein the second multi-pulse includes a leading pulse and a multi-pulse having corresponding high second multi-pulse level and low second multi-pulse levels, and a power level between an end of the second multi-pulse and a first one of the pulses of the first multi-pulse set to the high second multi-pulse level, and the high second multi-pulse level set between the low and high first multi-pulse levels (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from Pc1 to Pa, suggests that the power level of a period between an end point of the second multi-pulse and a start point of the first multi-pulse is the high second multi-pulse level).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the apparatus of Ohno, so that the power level of a period between an end of the second multi-pulse and the start of the first multi-pulse is the high second multi-pulse level as suggested by Ichihara. One of ordinary skill in the art would have been motivated to do

this because having a high second multi-pulse level between the end of the second multi-pulse and the start of the first multi-pulse will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 2:

Ohno discloses the apparatus of claim 1, further comprising:

a pickup unit (see Fig. 5, element 5) generating light to form the first state and the second state on the optical recording medium in accordance with the first multi-pulse and the second multi-pulse of the recording waveform generated from the recording waveform generating unit.

Regarding claim 3:

Ohno discloses the apparatus of claim 2, wherein the pickup unit comprises:

a laser device (Fig. 6, element 5 inherently includes a laser device) generating the light varying in accordance with the first multi-pulse and the second multi-pulse to form the first state and the second state on the optical recording medium.

Regarding claim 4:

Ohno discloses the apparatus of claim 3, wherein the laser device has a voltage to generate the light, and the voltage varies according to the first multi-pulse during forming the first state and in accordance with the second multi-pulse during forming the second state (see Figs. 4(a)-4(b); the voltage inherently varies according to the multi-pulses).

Regarding claim 5:

Ohno disclose the apparatus of claim 3, wherein the voltage is not a DC voltage (see Fig. 4(b), the voltage of the first and second multi-pulses are not direct current voltage).

Regarding claim 6:

Ohno discloses the apparatus of claim 1, wherein the input data comprises NRZI data having a high potential and a low potential each representing one of the first level and the second level (see Fig. 4(a)).

Regarding claim 7:

Ohno discloses the apparatus of claim 1, wherein the first state is a mark, and the second state is a space (see Figs. 4(a)-4(b)).

Regarding claim 8:

Ohno discloses the apparatus of claim 1, wherein the first mufti-pulse is a recording pattern to form a mark, and the second multi-pulse is an erase pattern to form a space (see Fig. 4(a)-4(b)).

Regarding claim 9:

Ohno discloses the apparatus of claim 1, wherein the recording waveform generating unit generates a cooling pulse connecting another first multi-pulse preceding the second multi-pulse and which extends from a trailing one of the pulses of the another first multi-pulse to the leading one of the pulses of the second multi-pulse (see Fig. 4(b); the leading pulse of the second multi-pulse includes a cooling pulse, which connects the first multi-pulse and the second multi-pulse).

Regarding claim 10:

Ohno discloses the apparatus of claim 9, wherein the cooling pulse forms a portion of the first pulses and a portion of the second pulses (see Fig. 4(b)).

Regarding claim 12:

Ohno discloses the apparatus of claim 1, wherein the high second multi-pulse level is less than the high first multi-pulse level (see Fig. 4(b)).

Regarding claim 16:

Ohno discloses the apparatus of claim 1, further comprising:

a servo unit (see Fig. 6, element 6) rotating the optical recording medium according to one of the first multi-pulse and the second multi-pulse during forming the first state and the second state.

Regarding claim 18:

Ohno discloses the apparatus of claim 1, wherein the recording waveform generating unit detects information data representing a characteristic of the second multi-pulse (see Fig. 6, the information data is generated by the recording waveform generating unit 8, which includes the sequences or characteristic of second multi-pulse).

Regarding claim 20:

Ohno discloses the apparatus of claim 18, further comprising:

a servo unit rotating the optical recording medium in accordance with the information data (the servo unit inherently rotates the recording medium in accordance with the information data received/detected by the waveform generating unit in order to accurately record the data onto the recording medium).

Regarding claim 21:

Ohno discloses the apparatus of claim 18, further comprising:

a laser device (see Fig. 6, element 5 includes a laser device) recording the information data on the optical recording medium.

3. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied to claims 1 and 16 above, and further in view of Ushiyama et al. (US Pub. No. 2002/0176338; hereafter Ushiyama).

Ohno and Ichihara discloses all the limitations that are in claims 1 and 16 for the reason set forth above in the 103 rejection.

Ohno also discloses an apparatus, wherein the second multi-pulse comprises a starting pulse and an ending pulse (see Fig. 4(b)). However, Ohno does not indicate the rotation speed is controlled in accordance with one of the starting pulse and the ending pulse of the second multi-pulse. On the other hand, Ushiyama discloses an information recording apparatus, wherein the servo unit controls a rotation speed of the optical recording medium in accordance with one of the starting pulse and an ending pulse of a multi-pulse (see Ushiyama et al., paragraph [0021] and Fig. 11; different speed corresponds to different pulse width and power level of first pulse, multi-pulse, and last pulse).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to control the rotation speed of the optical recording medium in accordance with one of the starting pulse and an ending pulse of the second multi-pulse in the apparatus of Ohno as suggested by Ushiyama. One of ordinary skill in the art would have been motivated to do this, since it is possible to provide an optical disc apparatus that suppresses an edge shift caused by the shape change of the recording mark accompanied with the linear velocity change (see Ushiyama, paragraph [0026]).

4. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied to claims 1 and 18 above, and further in view of Iida et al. (US Pub. No. 2002/0027848; hereafter Iida).

Regarding claim 19:

Ohno and Ichihara do not, but Iida discloses the information data is recorded on the optical recording medium as a wobble signal (see paragraph [0166]; the recording laser power information is encoded in the wobble information that is recorded on the recording medium).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the apparatus of Ohno, wherein the information data representing the characteristic of the second multi-pulse is recorded on the recording medium as wobble signal as taught by Iida. One would have been motivated to do this, because the compatibility with know CD format discs can be maintained when the physical characteristic information such as the recording power information is recorded as wobbling signal in the groove (see paragraph [0451]).

Regarding claim 22:

Ohno and Ichihara do not, but Iida discloses the optical recording medium comprises a lead-in area, and the information data is recorded in the lead-in area of the optical recording medium (see paragraph [0316]).

It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to record the generated information data of Ohno in the lead-in area of the optical recording medium as suggested by Iida, so that information data representing the

characteristic of the second multi-pulse can be read from the lead-in area in order to set the recording parameter.

5. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied to claims 1, 18 and 21 above, and further in view of Ando (US 6,088,315).

Regarding claims 23 and 24:

Ohno and Ichihara fail to show a servo unit receiving the information data read from the optical recording medium; however, Ando discloses an optical recording apparatus, comprising a servo unit receiving the information data read from the optical recording medium and rotating the optical recording medium at a speed corresponding to the received information data (see col. 6, lines 14-20); and/or a servo unit rotating the optical recording medium in a first speed (the constant linear velocity corresponds to the first speed), receiving the information data from the optical recording medium, and rotating the optical recording medium at a second speed (the constant angular velocity corresponds to the second speed) according to the received information data (see col. 6, lines 14-34).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the servo unit of Ohno such that it receives information data to control the rotational speed of the recording medium as taught by Ando. One of ordinary skill in the art would have been motivated to do this, because rotational control of the servo can be accurately carried out according to the type of the disc being read.

Allowable Subject Matter

6. Claims 11, 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claim 11, none of the reference of record alone or in combination disclose or suggest **a cooling pulse has a level less than the low first and second multi-pulse levels**.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LC 5/21/07

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER